GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, FEBRUARY 21, 1894.

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Mr. Vanderbilt's Forest.

THE appearance of the short report which has been lately published on the forest operations instituted on Mr. George W. Vanderbilt's estate of Biltmore, near Asheville, North Carolina, marks what must be considered a most important step in the progress of American civilization, as it records the results of the first attempt that has been made on a large scale in America to manage a piece of forest property on the scientific principles which prevail in France, Germany and other European countries where a dense population has compelled a more careful husbanding of all natural resources than the American people, made reckless by the apparently inexhaustible richness of their country, have not thought it necessary to emulate. A century of waste, of careless cultivation, of an excessive cutting of forests, and of a still more destructive reign of forest fires, have, however, worked their inevitable results, and thoughtful men long ago began to recognize the fact that unless some method of perpetuating the forests of the country could be devised, its agricultural ruin was merely a question of time.

A great deal has been written during the last ten years in the United States about the importance of preserving the forests of the country, and the subject is one that has appeared attractive to orators of various degrees of ability. But example is better than precept, and it has been left to Mr. George W. Vanderbilt to set an example in forest management which is likely, as the years roll by, to have a momentous influence on the prosperity of this country.

The report on the Biltmore forest is written by Mr. Gifford Pinchot, a student of forest management in the best schools of Europe, and a man fully alive to the advantages and disadvantages of the different methods in their application in this country. The Biltmore forest, as mapped and described in this report, is composed of about 4,000 acres, or just one-half of the whole estate, although, since this forest was first laid out, Mr. Vanderbilt's holding of forest property in the same region has been very largely increased, so that his forest operations may be expected to assume in the future much more important dimensions.

The Biltmore forest, as Mr. Pinchot found it, was composed chiefly of Oaks and other deciduous trees, mostly young, with scattered Pines which occasionally covered old and exhausted fields to the exclusion of other species. The forest was broken and irregular in character, owing to the fact that the land had been divided among many small farmers who had made frequent clearings or had robbed the forest, depleted of its young growth by browsing animals, of its most vigorous and healthy trees. The soil produced by the disintegration of an ancient gneiss, intermixed with pegmatitic quartz, is a stiff sandy loam of considerable depth, but not rich in plant-food or specially favorable to the growth of trees.

Mr. Pinchot's scheme, as he sketches it in his report, proposes three general objects—a profitable production which will give the forest direct utility, a nearly uniform annual yield which will give steady employment to a trained force of foresters, and a gradual improvement in the present unsatisfactory condition of the forest. These objects he proposes to obtain by two methods of management. On the east side of the French Broad River, which divides the estate, the regular high-forest system will be adopted, and on the west side the selection system. The rotation—that is the length of time allowed for a second crop to become ripe on the same ground after the removal of the first crop—has been fixed at one hundred and fifty years. In a theoretically perfect forest, managed under this high-forest system, there are as many subdivisions as there are years in the rotation, the trees of each subdivision being of an equal age and only one year older or younger than those of the next subdivision. In this way it would be possible to cut every year one one-hundred and fiftieth of the whole area, thus securing a uniform annual crop during the whole period. In the selection—forest trees of all ages are mixed together instead of being separated in groups according to their ages. The annual product is taken from all parts of the forest, the ripe trees being selected for cutting; but such a method necessitates, in the case of a large forest area, expensive transportation, and to avoid this Mr. Pinchot has adopted what he calls the localized selection system, under which the annual yield is taken from a certain part of the forest during several years, then from another part, and so on.

Mr. Pinchot's balance-sheet, covering the first year's operations of the Biltmore forest, shows an expenditure of $9,911.76, with receipts amounting to $5,607.11, and material on hand worth at local market prices $3,911.25, or $9,519.36 in all, showing a deficit of only $392.40. In the year 1893, as we are informed, this deficit became a surplus of more than $1,200—certainly a remarkable result, in view of the poverty of the forest he had to operate in and the difficulties which are always attendant upon the establishment of a new industry, especially in one like this, where all his assistants and workmen had to be formed from the very beginning.

Mr. Pinchot may, perhaps, consider himself unfortunate in the character of the existing forest-covering of the land which has been placed in his hands to manage, as the poverty of the soil over much of the area embraced in the Biltmore forest will prevent its rapid rehabilitation and probably preclude the production of timber of the first class. On the other hand, however, he is especially fortunate in having secured a constant demand for fire-wood within easy reach of the forest and on the estate itself, without which, or some steady local demand, it would be impossible for him to carry out his plans of improvement by cutting except by a prohibitive outlay of money.

A forest, like any other piece of agricultural property, is more or less profitable in proportion to its ability to produce material for which there is a demand at remunerative prices; and while it is certainly true that a virgin forest composed of trees of the first class would yield larger returns under scientific management than can ever be obtained from the Biltmore forest, it must be borne in mind that an example like this, provided the forest can be made to yield a fair return on the investment, will be of greater value to the country as an object-lesson than one where

the returns were larger from land of a better character, for what we want in this country is to learn how land too broken and too poor for tillage can be made to earn permanently and regularly a fair interest on its value through the application of the laws which govern the art of forestry.

Such a lesson the country will soon be able to learn from the Biltmore forest, which, if it is supplemented as it is now proposed, by a great arboretum in which are to be gathered all the woody plants of the temperate regions of the world, and by a series of small special plantations of various trees, native and foreign, made for the purpose of testing their value for forest-planting on a larger scale, will form a museum of remarkable comprehensiveness and interest; and Mr. Vanderbilt will have performed a service to his country of the highest practical value in furnishing opportunities for study which will be of untold value in the future to the scientific forester, the landscape-gardener and the dendrologist, and through them to the nation.

Notes for Mushroom-eaters.—V.

TUBE-BEARING FUNGI.

WE may now leave the gill-bearing fungi and pass to those where the under side of the pileus is formed, not of radiating gills, but a series of narrow tubes packed closely together (see Figs. 13 and 14). The mouths of the tubes can usually be recognized with the naked eye, but in some cases they are so small that one needs a hand lens to see them clearly. This group, the Polyporieæ, includes many species, but not as many as the group of gill-bearing fungi, and the edible species are comparatively few, for many of the species are hard or corky. As common illustrations of fungi of this group, we may mention the large forms growing on trees, which are used by ladies for making brackets and vegetable cameos, and the common hemispherical or disk-like species which abounds on Birch-trees. To the fungus-eater such hard and corky species have, of course, no value. By far the greater part of the fleshy, succulent, toadstool-shaped fungi of the present group belong to the genus Boletus, a very dangerous genus on the whole. The species of Boletus abound in woods and fields during the summer and autumn, and sometimes attain a great size. Unfortunately, the recognition of the different species is a difficult matter, even for experts, and, since many of the species are dangerous, the beginner should be especially cautious. No species of Boletus is probably as poisonous as the Agaricus phalloides, described above, but serious accidents have happened in this country to persons who have experimented with Boleti. It is out of the question that we should enter upon a detailed description of the different species. We can only mention the general characters found in the dangerous Boleti. In some species, when the fungus is cut or broken, the flesh changes color, becoming usually blue, and sometimes reddish. In some cases merely handling the fungi brings out the blue color, in others the change takes place slowly. As yet, no satisfactory explanation of the change of color has been given, but, whatever the cause, the change is not permanent. In selecting Boleti we may lay down the rule: avoid all those in which the flesh changes color on exposure to the air or on pressure. Again, one should notice the color of the tubes and of their mouths. The species which have red-mouthed tubes, or where the mouth is of a much deeper color than the rest of the tube, are also to be avoided. A few Boleti have a peppery or acrid taste, like certain of the Russulæ and Lactarii mentioned above, and it is the part of prudence to avoid them. Excluding the species which have an acrid taste, those in which there are red-mouthed tubes and those in which the flesh changes color, there is still left a good many species, but, even then, one should experiment cautiously, although the danger is not great.

Fig. 13.—Boletus subtomentosus.

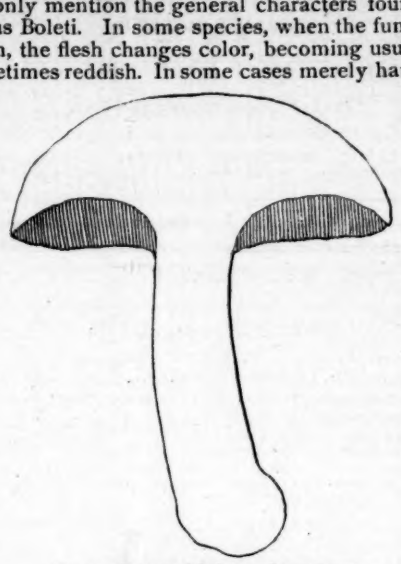

Fig. 14.—Section of Boletus subtomentosus.

Certain species of Boletus are among the best of fungi, and their large size makes them very desirable. The Cèpe, Boletus edulis, is imported into this country from France, principally from Bordeaux, although, according to Gautier, the species is not one whose sale is authorized in the Paris market. It is also common in a good many places in this country, especially in stony places near the borders of woods; but it is far from easy to describe it so that a beginner can always distinguish it from other species. The pileus is convex, from purple-brown to yellow-brown, or even paler, smooth, thick and fleshy; the flesh white and unchangeable; under surface convex and grooved around the top of stipe; tubes as much as an inch long, at first white, but becoming yellow and then greenish; stipe rather stout and often bulbous at base, paler than the pileus, having at the top a slightly reticulated surface. If all the above marks are present there can be no trouble in recognizing the Cèpe, but it must be admitted that the description is rather long to be recollected without an effort. The imported Cèpes are gathered growing wild, and not cultivated in beds like the Mushroom, and hence one must necessarily be a little suspicious of those sold in our market. When well-cooked the Cèpe is delicate and easily digested, but when prepared, as it generally is, à la Bordelaise, it may cause gastric irritation, which might lead one to suppose that the species was poisonous.

In this connection should be mentioned the Beefsteak fungus, Fistulina hepatica, common in the south, but less common in the north, although it is sometimes found there

in sufficient quantity for eating. It grows on stumps of Oak or Chestnut, and may attain a large size, especially in the south. As its French name, Langue de Bœuf, implies, it resembles a thick tongue projecting from the stump, with a very short stipe. When young the surface is covered with a beautiful peach-colored or red down, but when mature the upper surface is deep red and mucilaginous. The under surface is pale buff color and covered with minute papillæ like a tongue. This is due to the fact that here the tubes are not in close contact with one another, but nearly free. Sections of the fungus show a streaked red surface like a steak. The taste, when gathered, is slightly, but agreeably, acid. The fungus is unmistakable, and when broiled has a most extraordinary resemblance to a tenderloin-steak. It is to be regretted that it is not more common with us.

With regard to the teeth-bearing fungi, Hydneæ, little need be said. They are not very numerous, and the greater part of them are either too tough or too small to be of value as food. We have the large, scaly, dark brown or blackish form, much esteemed in Germany, under the name of Habichtschwamm, Hydnum imbricatum, and the more delicate Hydnum repandum, with a pileus varying from dull yellow-red to nearly white, with teeth lighter-colored than the rest of the fungus. Practically none of our teeth-

Fig. 15.—Clavaria aurea, Coral-fungus. Small specimen, life-size—edible.

bearing fungi are poisonous, but, as a rule, they have a somewhat bitter taste, liked by some persons, but not by the writer.

Besides the three groups of the gill, tube and teeth-bearing fungi, there is a small group of coral-shaped fungi, some of which are of good size and very palatable. We need only refer to Fig. 15, which will give the reader a sufficiently clear idea of the common and larger species of this group. None of the coral-shaped fungi are poisonous, and the beginner can venture to eat any of them without hesitation.

Harvard College. *W. G. Farlow.*

Foreign Correspondence.

London Letter.

MUSA AURANTIACA.—This is a handsome-flowered dwarf Musa, which was discovered in Assam by Mr. Gustave Mann, who sent it to Mr. Wendland, of the Herrenhausen Botanic Garden, some years ago, where it flowered lately, and the inflorescence has been forwarded to Kew. It is like the old M. coccinea in habit and stature, the stems being only two or three feet long, the leaves three feet long, and the terminal, erect, stout scape nearly a foot long. The charm of the plant is in the rich orange color of the large bracts which clothe the upper part of the scape and partly enclose the yellow flowers, which occur usually in threes. There are examples of this species in the Palm-house at Kew, where it forms crowded clusters of stems in pots about fifteen inches in diameter. It is a worthy companion to M. coccinea and M. Mannii, and these three Musas deserve to be in every good collection of stove-plants.

BEGONIA PAUL BRUANT.—Among the best of all winter-flowering Begonias is this species. There are plants of it in the Kew collection which have been in flower for the past fortnight, and promise to continue in full display for several weeks more. They are well formed, two feet high and through, with elegant foliage; the stalks nine inches long, red, hairy; the blades of the usual oblique, sinuously toothed character, and from six to nine inches long. The racemes are on scapes as long as the leaf-stalks, and each raceme is a broad, branched, elegant bunch of pink flowers and bracts. The female flowers predominate, and their beauty is largely due to the conspicuous broad-winged ovary, which is of a darker shade of rose than the petals; each flower is over an inch across. There are no Begonias at Kew so beautiful in January and February as this one. It was raised and sent out by Bruant, of Poitiers, in 1892. I suspect its parents are B. manicata and B. phyllomaniaca.

DENDROBIUM ATROVIOLACEUM.—This is a much more attractive Orchid than was anticipated when it was first introduced by Messrs. J. Veitch & Sons in 1889, and named by Mr. Rolfe. A specimen of it in flower, shown a few weeks ago, was awarded a first-class certificate by the Royal Horticultural Society, and it has since been figured or described and recommended by most of the gardening papers here. In general characters it approaches D. macrophyllum (Veitchii), and it is a native of the same place as that species—that is, New Guinea. It differs, however, in its shorter pseudo-bulbs and leaves, and in the brighter color and glabrousness of its large flowers. The racemes are erect, eight inches long, bearing from four to eight flowers, which are two and a half inches across, creamy yellow, with purple spots, except the lip, which is rich violet-purple inside, deep green outside. It is a much more attractive Orchid than D. macrophyllum.

DENDROBIUM WARDIANUM.—An importation of magnificent plants of this beautiful species was sold by auction this week. Orchid importers are so much cleverer now than they were fifteen or twenty years ago that they can import all the better-known and easily collected species in as healthy a condition as though they had been taken from the trees upon which they grew immediately into the sales-rooms. I have seen this species of Dendrobium fetch very high prices at sales, but it was in the days when the plants used generally to arrive in bad condition; now one can get very good specimens of it for about the same price as Camellias. Although D. Wardianum is fairly good-natured under cultivation, it is one which gradually weakens and rarely survives five years' treatment in an Orchid-house. Luckily, however, it is apparently plentiful in Assam. There are few more beautiful objects than a good specimen of D. Wardianum when in flower.

CYPRIPEDIUM CHARLESWORTHII.—This new and distinct species bids fair to soon become as plentiful and cheap as the commonest of all C. insigne. Several large importations of it have lately been sold by auction in London since it was first introduced some three months ago, and plants which then sold for guineas would not now fetch shillings. Messrs. Low & Co. offered this week a large consignment of plants in perfect health, although only just received from the home of this species, which I suspect is upper Burma. While small plants realized about ten shillings a dozen, large tufts, with twenty or thirty growths, were sold for about two pounds. It is satisfactory to be able to state that this species is at least as happy under cultivation as its near ally C. Spicerianum, and good, easily grown Orchids are always welcome, in however large quantities they may come.

IRIS BAKERIANA.—All the Irises of the reticulata group are delightful spring-flowering plants, which any one may

grow, either in pots for the conservatory or in the open border. Several of them have been in flower a week or more outside at Kew, but the most charming of all, so far, is I. Bakeriana, as represented by a potful grown in full blow in the Alpine-house along with rare Snowdrops, Crocuses, tufted Saxifrages, etc. The Iris is exactly like I. reticulata; indeed, is in my opinion only a variety of it. The flowers, which are on erect scapes six inches high, are of the most charming satiny blue color, and the lip-like claw is colored rich violet-blue. Flowering in January, lasting over a fortnight and being delightfully fragrant, this is an Iris of special value. It was introduced from Armenia in 1889, and was named by Professor Foster in compliment to Mr. J. G. Baker, F.R.S., of Kew.

Narcissus Trimon.—This is an interesting and pretty hybrid between N. triandrus and N. monophyllus, which was raised by Professor Michael Foster in 1890. It possesses all the charm of both of its parents, and is an improvement upon N. monophyllus in its sturdier constitution. Plants of it are now in flower in the alpine-house at Kew. The leaves are Rush-like, and the scapes are nine inches long, usually two-flowered, each flower being two inches across; the segments an inch long, spreading, and the cup two-thirds of an inch deep, with an even edge. The whole flower is milk-white. In the same house there are examples in flower of N. monophyllus, a delightful little Daffodil, with its delicate snow-white flowers, with orange anthers. Professor Foster's name for his hybrid is an attempt to indicate the parentage by combining the first syllable of each name. In my opinion, the plant deserved a prettier name.

Darwin Tulips.—English horticultural papers are actively discussing these plants just now, some of them holding that the "race" recently named in compliment to the great naturalist, and offered by Messrs. Krelage & Sons, of Haarlem, is not in any way distinct from the old "Breeder" Tulips, which are forms of T. Gesneriana. In my opinion, there is a difference, the plants offered by Messrs. Krelage being much superior in color attractions to the "Breeders" of English gardens. The former have been grown at Kew several years now, and their extraordinary colors attract considerable attention. No less an authority than Sir Frederick Leighton, on seeing them at Kew two years ago, expressed himself delighted with them because they were so different from and so much more artistic in color than the Tulips usually grown in gardens. If the quibbling over the name only leads to the general cultivation of these Darwin Tulips it will have been productive of some good. I would rather call them Darwin than Breeder Tulips, even if they were identical, the latter name suggesting something unfinished or imperfect, whereas the flowers themselves are beautiful in their colors, kaleidoscopic, never harsh or disagreeable to the eye, and often showing the most subtle blending of browns and purples and greens; in short, all colors. Breeder Tulips have never held a very prominent place in English horticulture, not within the last twenty years, at any rate; but, unless I am much mistaken, these Darwin Tulips of Messrs. Krelage are certain to become favorites with all who love true beauty of colors in a flower. It appears as if T. Gesneriana has been as prolific in variety as Hyacinthus orientalis, the parent of all garden Hyacinths, or Pelargonium zonale, whose progeny is the garden Geranium in its hundreds of varieties.

Petasites fragrans.—An excellent use for this plant is as scent-maker in the conservatory or greenhouse. In England it is wild, though not a native, and it is not uncommon in gardens, where it is known as Winter Heliotrope, flowering in December and January in ordinary winters. Some tufts of it should be included in every conservatory for the sake of its powerful and agreeable odor. In the border outside it is apt to become a weed and choke out everything else, but in a conservatory it is weaker and therefore easily kept within bounds. In the alpine-house at Kew several tufts of it are planted under the stage, where they are now in flower. The foliage is handsome, and the racemes are nine inches high, branched, and crowded with heads of whitish flowers with purple anthers. It is also a good plant for the margins of streams. It is worth a trial in the conservatory, and even might be grown for the sake of its flowers for cutting purposes. They are white in the greenhouse.

London. *W. Watson.*

New or Little-known Plants.

Darbya umbellata.

THE Sandal-wood family, which is chiefly tropical, appears in the eastern United States with half-a-dozen species of plants, in four genera. Of these, Comandra, small parasitic herbs, is common at the north with three species, and Pyrularia, the Oil Nut, which is also represented in the Himalaya forest, is a common shrub in the southern Alleghany Mountain region. Buckleya, the third genus, has one representative in North America, one of the rarest of all American plants (see Garden and Forest, vol. iii., p. 237), and another in the mountain forests of central Hondo, in Japan. The fourth genus, Darbya, is monotypic, and, although it was discovered more than fifty years ago, it is only recently that the discovery of the pistillate plant and of ripe fruit has made it possible to complete the description of its characters.

Darbya is a glabrous shrub, with slender, terete or quadrangular dark-brown branchlets, often roughened with dark lenticels, long, thick stoloniferous roots, and deciduous leaves without stipules. The leaves are ovate, narrowed at both ends, reticulate-venulose, entire, with slightly revolute margins, thin and membranous, dark-green on the upper surface, pale on the lower surface, an inch and a half to two inches long, and three-quarters of an inch to an inch wide on the fertile plant, or not more than half as large on the sterile plant, with slender, pale midribs, remote oblique veins forked near the margins, and short stout petioles. The staminate and pistillate flowers are greenish-white, apetalous, and produced on separate individuals from the axils of leaves of the year, the former on slender pedicels in five or six-flowered pedunculate umbels, the peduncles nearly as long as the leaves, the latter, solitary and articulate on short stout peduncles. The calyx is usually four, sometimes three or five, lobed, and slightly puberulous on the outer surface of the short, thick acute lobes which are valvate in the bud, and after anthesis are spreading and reflexed; it is turbinate in the staminate flower, and nearly twice as long and cylindrical in the pistillate flower, and is lined with a thick, cup-shaped, slightly lobed disk, on the margin of which and on the lobes are inserted, opposite the divisions of the calyx, the four, or sometimes three or five, introrse, slightly exserted stamens, with short, stout, flattened filaments furnished at the base, on the outer side, with small tufts of pale hairs, and oblong anthers attached on the back below the middle, and two-celled, the cells opening by longitudinal slits. In the pistillate flower the stamens are rather smaller, included, and apparently fertile. The ovary is inferior and abruptly narrowed into a short, exserted, thick, conical style, tipped with a four-lobed spreading stigma; before fertilization, the cell and its ovaries are not distinguishable, the whole of the flower below the disk consisting of a homogeneous pulpy mass; in the sterile flower there is no trace of an ovary, the cavity of the disk extending to the bottom of the calyx. The fruit is a nearly globose drupe, crowned with the remnants of the calyx-limb, with thin, dry, mealy flesh, a thin-shelled light brown nutlet, and a globose seed, covered with a thin membranous scurfy testa closely investing the large mass of fleshy albumen. The embryo is axile and erect, with linear cotyledons much longer than the short erect radicle turned toward the hilum.

Darbya, of which only one species is known, Darbya umbellata, was established by Dr. Asa Gray, who characterized the staminate plant only in the *American Journal of Science* in 1846 (ser. 2, i., 388). It had been found a few

years earlier by Dr. Boykin near Milledgeville, Georgia and near Macon by Professor Darby, and in the neighborhood of Lincolnton, in North Carolina, by Mr. M. A. Curtis. Nothing more was seen or heard of Darbya until the spring of 1882, when Dr. Charles Mohr found the staminate plant on Sand Mountain, in Cullman County, Alabama, south of the Tennessee River. In the spring of 1886 Miss K. A. Taylor, of Baltimore, found staminate plants near Columbia, South Carolina, and two years later the pistillate plant in the same locality; and the following notes from her pen give the best account of the habit and mode of growth of this extremely rare and interesting plant, which has not yet been brought into cultivation:

A few years ago (1886) I collected some specimens of the staminate plant, not then knowing its name or rarity. This year, in the middle of April, I made a thorough search in the same woods, about two miles south of Columbia, and found both staminate and pistillate plants growing in the greatest abundance and covering acres. The ground is high, and covered with woods composed of a few Pines, but principally of Oak, Hickory and other deciduous-leaved trees and shrubs. The soil is light, loose white sand, without stones, and is overlaid with a thick covering of leaf-mold.

The Darbya flourishes alike in sunny and shady situations. The roots are several yards long, an eighth to half an inch in diameter, dark red on the outside, white within, with rootlets at intervals of an inch or more; they branch every foot or so, and run in straight lines through the leaf-mold about two to six inches below the surface, crossing each other frequently and sending up shoots sometimes an inch and sometimes several feet apart. The leaves are always much larger on the pistillate than on the staminate plants. The two grow thickly and cover much ground, although the plants of the two sexes are never mingled, the groups being in no case, I think, nearer to one another than one hundred and fifty to two hundred yards. The plants grow from twelve to thirty-three inches high, and both kinds of flowers have a sweet musk-like odor. I noticed many small black ants visiting the flowers, and finding, apparently, something attractive at the base of the stamens.

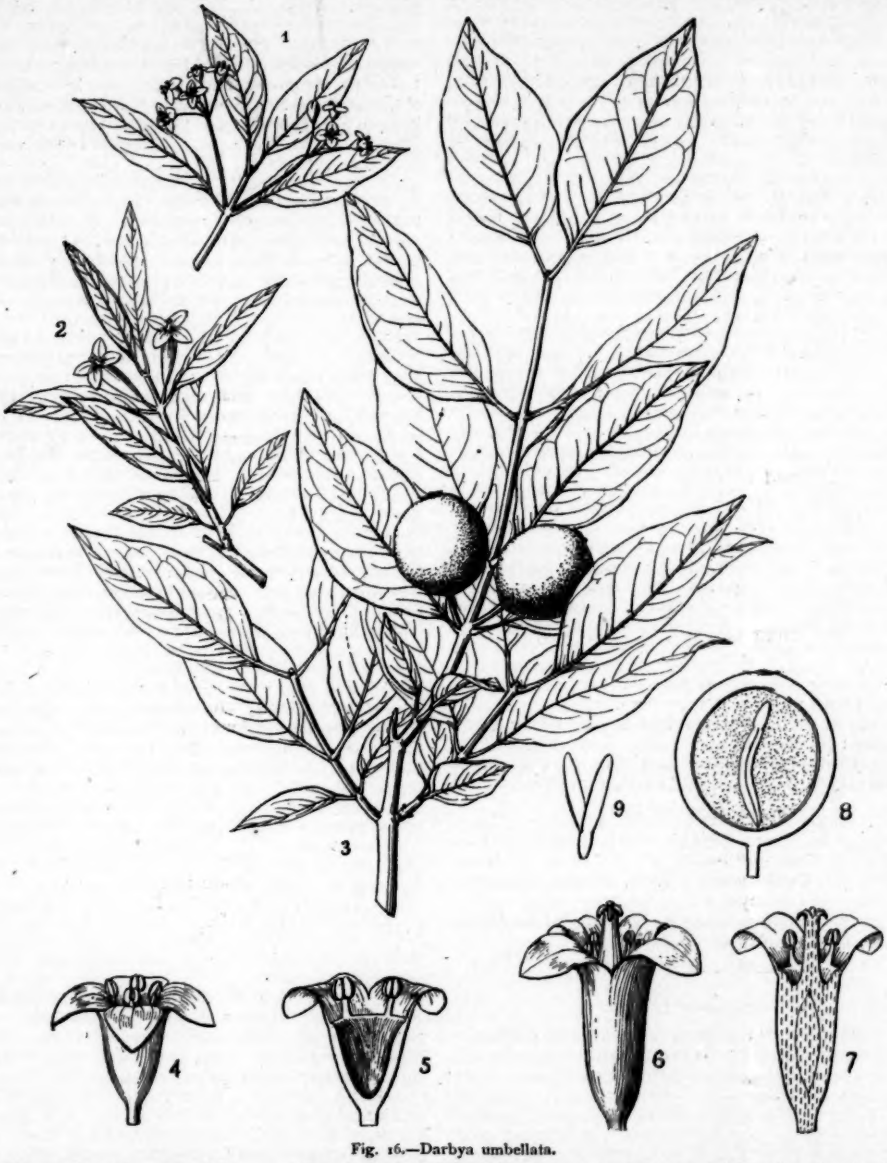

Fig. 16.—Darbya umbellata.

1. A flowering branch of the staminate plant, natural size. 2. A flowering branch of the pistillate plant, natural size. 3. A fruiting branch, natural size. 4. A staminate flower, enlarged. 5. Vertical section of a staminate flower, enlarged. 6. A pistillate flower, enlarged. 7. Vertical section of a pistillate flower, enlarged. 8. Vertical section of a fruit, enlarged. 9. An embryo, much magnified.

In 1888 Dr. Hyams also found fruiting plants of Darbya near Charlotte, North Carolina. *C. S. S.*

Cultural Department.

Propagation of Chrysanthemums.

OPINIONS vary as to the proper time to insert cuttings intended for specimen plants. For many years I put them in about the middle of January, and while this gave them a longer season of growth, it often happened that cuttings taken so early ran to bloom when transferred to six-inch pots in March. With no preparation for replacing the plants, these varieties were lost for that season. Many of the best varieties will bloom in this way, Viviand Morel being a noted instance. My experience has been that cuttings struck toward the end of February make good specimens. Preference should always be given to root-cuttings over stem-cuttings, particularly if the cuttings are from suckers. This is not always possible, however, and I well remember an old and beautiful deep pink variety, Damio, now almost lost to cultivation, as particularly shy in producing cuttings of any kind. Very fair plants may also be obtained from leaf-cuttings inserted with an eye, this being often the only means of propagating a sport. Last season some of my best flowers of Niveus were obtained from leaf-cuttings. It is better, whenever this is practicable, to take stock from plants which have been grown "cool." Many noted cultivators are following this plan, and grow their stock-plants out-of-doors until late in the autumn, when they are stored in cold frames until required. The reason that so many new varieties do poorly during the first season is that they have been forced and propagated to exhaustion.

We use a general propagating-bed where the bottom-heat is steady at sixty-five degrees, with a minimum air temperature of fifty degrees. This ensures quick rooting and gives us the space for other stock. Cuttings will root with a temperature as low as forty degrees, or even less, and in England it is customary in many places to put them in pots in cold-frames. By this plan, it is claimed, their constitution is strengthened, but I do not think it makes so much difference, especially in a plant which responds to good culture so quickly as the Chrysanthemum. Cuttings should be prepared with a good sharp knife, and shorn of a few leaves and the tips, which are liable to hang about the base of the cutting and encourage damping. They should be put in firmly, and set far enough apart so as not to touch, for when damping once commences it is almost impossible to prevent its spread throughout the whole bed. A liberal supply of water should be given for the first few days, and the plants shaded when the sun shines, for they must at no time be allowed to wilt. The cuttings should be rooted in three weeks, when they may be potted off into small pots, using a rather light soil, not made very firm.

A list of well-tested standard varieties which make good specimens includes:

White.—Ivory, Joseph H. White, L. Canning, Miss Kate Brown, White Gem, Mrs. W. G. Newitt, Parthenia, Mrs. Robert Craig.

Yellow.—L. C. Madiera, W. H. Lincoln, President Hyde, Mrs. Walter Baker, Mrs. Hicks Arnold, Mr. H. Cannell, H. L. Lunderbruch, Glorian, Fascination.

Red.—C. Shrimpton, Cullingfordii, G. W. Childs, Gladiator, C. B. Whitnall.

Pink.—Duchess of Connaught, Irma, Mrs. M. W. Redfield, Mrs. Fottler, Etoile de Lyon, Louis Bœhmer.

Wellesley, Mass. *T. D. Hatfield.*

Poinsettias.

WHEN the Chrysanthemum season is over there is usually a scarcity of flowering plants to brighten the conservatory or greenhouse, and nothing, in my estimation, forms a more striking display than a well-grown collection of Poinsettias. Plants, from which the bracts have faded or been cut off, should now be kept dry and rested for a few weeks in a house where a night temperature of forty-five to fifty degrees is maintained. About March 10th they may be removed to a warmer house, kept watered and freely syringed. By the end of the month a plentiful crop of cuttings will have appeared, which may be rubbed off at a heel and inserted in a sand-bed with a bottom-heat of seventy-five degrees. The cuttings must be shaded from sunshine and carefully watered until rooted, which should be in about four weeks after insertion. It should never be forgotten that any carelessness in overwatering may cause the entire batch to damp off.

When taken from the propagating-bed the young plants can be placed in two-inch pots in a compost of leaf-soil and loam in equal parts, with a dash of sharp sand added. They should be grown along in a house where they can have a night temperature of sixty degrees, and must be shaded from hot sunshine and grown well up to the light to keep them stocky. Syringing twice a day is highly beneficial. About the end of May the pots will be well filled with roots, and a shift may be given to four-inch pots. A little well-dried cow-manure may be added to the compost at this stage of their growth. From the middle to the end of June the plants can be moved into a frame and the pots half-plunged in ashes. By the middle of July the plants will be ready for their next shift into six-inch pots. At this potting we use a compost consisting of two parts loam, one part dried cow-manure, one part leaf-mold and a mixture of sand and powdered charcoal to keep the soil porous. After this shift the plants are replaced in the frame and kept freely ventilated, the sashes being tilted up, both back and front, by night and day. A syringing in the evening of a warm day is helpful. After remaining in the frame, perhaps, ten days, we plunge the plants in a bed of ashes in the open air, where we grow our Chrysanthemums. When the pots begin to fill with roots, liquid-manure is applied twice a week. Any liquid which suits the Chrysanthemums may be applied to the Poinsettias.

During the month of August it is well to stake up the plants securely, as high winds are apt to break them off at the bottom. When the cool nights of September come, the plants should again be placed in a frame, for a low temperature will cause loss of foliage quite as surely as overwatering will. About September 20th we place our plants in a house where a night temperature of sixty degrees is kept. If extra fine bracts are desired, it is well at this time to shift the plants into eight-inch pots. They must be kept close to the light and not crowded. When the bracts begin to appear, liquid-manure may be given freely, for Poinsettias are gross feeders. The plants should never be allowed to become either dry or water-logged, as the foliage will suffer in either case, and no plant looks worse with poor foliage than a Poinsettia. Many of the Poinsettias seen on private places are little better than long unsightly sticks with a few leaves on the top below the bract. As much skill and attention are required to grow Poinsettias with good foliage as to grow Orchids well.

In early December, when the bracts are well developed, the plants can be removed to a house ten degrees cooler. Among Callas, Eupatoriums and similar plants, Poinsettias make a beautiful display, and last in good condition longer than any other flower I know. At this time, February 14th, we have bracts in good condition which were fully expanded in the middle of December, and these measure from sixteen to twenty-two inches in diameter.

Of the several varieties of Poinsettias, P. pulcherima is the best for all purposes; P. plenissima, the so-called double scarlet species, is useful, and P. pulcherima alba, while not pure white, is desirable for variety. After the plants are dried off and have started into growth they will attain an extra size if they are shifted into larger pots. Several bracts will thus be produced on each plant, but neither in size nor in appearance are these as desirable as those grown on younger plants.

Taunton, Mass. *W. N. Craig.*

Chinese Orchids.

GROWERS of Orchids for cut flowers may be interested in a few Chinese species that are easy of cultivation and well suited for decorative purposes. The Chinese florists are peculiarly conservative in the matter of stock, and it is unusual to find more than fifty genera represented in their gardens. Novelties are scouted as new-fangled innovations. It is only the well-tried plants that have been hallowed by the appreciation of their forefathers, and endeared by association, that are thought worthy of careful cultivation. And yet there are thousands of native plants in the "Flowery Land" that rival and excel the cultivated kinds; but, as the ancient philosophers who established the canons of taste in China did not proclaim their beauty in some poem, they remain unappreciated. I have often been amused, while botanizing in China, to notice the look of tolerant compassion, and sometimes incredulous suspicion, with which the villagers regarded me when it was explained to them that I was collecting wild plants. They generally looked upon me as a harmless kind of maniac, or else a prospector in search of gold or silver trying to cloak nefarious designs under a silly pretext.

The Chinese botanists have a crude plan of classifying plants, but nothing approaching the Linnean or natural mode of classification in systematic analogy. Terrestial Orchids are called Lan-fa—a general term for gynandrous plants and those with a single flower on a peduncle. The epiphytal kinds are known as Tiau-lan-fa, and the term is applied rather indiscriminately

to other epiphytal and parasitical plants. The written Chinese character tiau literally means suspended, and lan, in this connection, denotes few or rare, but has other meanings. Fa means a flower.

I have never seen terrestrial Orchids grown so well as they do them in Canton, particularly Phajus grandifolius and Arundina Chinensis. Phajus grandifolius is generally grown in clumps, massed in twelve-inch pots, and they produce more than a dozen strong spikes of flowers from three to four feet high. The soil used is the rich manurial mud from the banks of the Canton River; this is dried in the sun and afterward broken up into disks about an inch square, and simply thrown into the pot without crocks or any kind of drainage. The disks retain their knobby form and allow the air and water to percolate freely through the mass. Pigs' hair is often mixed with this compost, and weak manure-water is given in the growing season. No water is given in the resting season.

The annual rainfall in that district is seventy-five inches. Little or no rain falls during the months of November, December and January, and the Chinese are careful to give their Orchids complete rest during these months. Arundina Chinensis is treated in the same way, and I have grown large beds of this Orchid in Hong Kong, for cut flowers, in ordinary garden soil, the supply of flowers continuing for several months. I am disposed to think that most of these semi-hardy Chinese Orchids could be grown by florists on ordinary Rose-benches, and I am rather surprised to hear that Phajus grandifolius has not already become an American cut-flower specialty like the Chrysanthemum and Lilium longiflorum, both of which come from the same geographical district. These Orchids grow side by side with Lilium longiflorum and Chrysanthemum Indicum, and in comparison are more floriferous and vigorous than either of the other plants.

Renanthera coccinea is perhaps the most striking of Chinese epiphytes, but importers complain that it is a shy bloomer. This is, no doubt, the case where it has not been sufficiently rested and ripened with sunlight in the proper season. Even in China, where it is often seen flourishing on trees surrounding temples and monasteries, the plants grow rampantly, but are always green and succulent if the groves are too dense. If grown on semi-deciduous trees or pollard-stumps, or ordinary blocks exposed to the sun, it will, however, flower luxuriantly. Its brilliant reddish-brown panicles measure from two to three feet in diameter and dangle around the tree from top to bottom a blaze of cardinal bloom. After the first dry season the leaves of the young shoots turn a yellowish-green if they are well exposed to the light; this is the sign of well-ripened wood, and they usually flower well. If Orchid growers would keep the syringe away from their plants as much as possible during the resting season and hang them horizontally well up near the glass, I think they would be more successful with this magnificent Orchid. Dendrobium aggregatum is a plant that likes similar treatment, but is not by any means so fastidious. Plants of this species grow well on splits or trunks of Mango-wood (Mangifera Indica), Neem (Melia Azedarach) and Silk cotton-wood (Bombax Malabarica).

Other good Chinese terrestrial Orchids that can be grown in the same way as the Phajus are Cyrtopera flava, Habenaria Susannæ, Spathaglottis Fortunei and Bletia hyacinthina.

Manchester, Mass. *A. B. Westland.*

Annual Flowers from Seed.—II.

BEGONIA VERNON, while not botanically an annual, is practically one for garden purposes. This is one of the most useful of the newer plants, and, fortunately, is readily propagated by seeds, which it bears very abundantly, as well as by cuttings. The plant forms numerous stout stems which bear clear crimson flowers very freely and persistently. In fact, it is a variety of the old ever-blooming or semperflorens species. This is one of the few Begonias which will bear full exposure to the sun during the summer, and the sun has the curious effect of giving the leaves a reddish purple tint. This tint also appears on the peduncles and on the seed-pods as they mature. Either for bedding or for cutting, this variety is most useful and attractive. There is also a golden-leaved variety with pink flowers. From a packet of seed one will secure forms of this Begonia with flowers of different shades of red. In the greenhouse, Begonias of the semperflorens type are apt to spring up everywhere from self-sown seeds, and under glass their cultivation offers no difficulties. A pan of fine earth is well watered, and the dust-like seeds are scattered over it as thinly as possible. The pan should be covered and kept at a temperature of seventy degrees for a week, after which the seeds may be expected to germinate at any time, and after this the pan should be more carefully covered, and it should at no time be too wet. If the pan is covered with a glass this should be reversed every day, and after the germination of the seeds it should be removed entirely. If a re-watering of the seed-pan is necessary before the seeds have germinated, or when the plants are small, the pan should be dipped in water, not so deeply that it will flow over the rim, but deep enough to allow it to flow in through the drainage-holes. A pan of fine seed or small plants should never be sprinkled or watered from above. The failure to germinate tender seeds is often caused by an excess of water, and this excess will be especially fatal if from some cause the temperature of the seed-pan should fall below the point at which the seed germinates. Where there are no greenhouse facilities, these Begonia-seeds and others of similar character can be readily germinated in a warm living-room, but in this case one had better use a deep pot which is telescoped within a larger one, with a packing of moss between. The outer pot is to be plugged, and water may be applied through the moss. The advantage of this contrivance is that it not only holds moisture, but it is not so quickly influenced by changes of temperature as is a shallow pan. The plants may be allowed to grow in the seed-pan, well-exposed to the light and air, till they are of a convenient size to transplant. Shifted into light, open, moderately rich earth, they will progress rapidly, come soon into flower, and if they are sown early in March will be in fit condition for the borders in June.

Calliopsis (Bright Eyes) are among the handsomest of our native flowers, and few annuals are more appreciated in gardens. Their dark brown eyes give them a greater individuality and effect than the hardy perennial Coreopsis, which is also much grown. The forms showing markings and suffusions of dark velvety maroon are also specially desirable. Seeds of Calliopsis are preferably sown in the open in late summer or early fall, where they make low mats of foliage, perfectly hardy, and from these strong flowering stems arise in early spring. If this planting has been neglected, satisfactory, but not so strong, plants may be had from plantings made in April or May with other annuals. The seeds germinate readily and require no special treatment. Plants are not averse to removal in a young stage.

Calendulas (Pot Marigolds) are showy annuals of the hardiest and freest flowering character. The double kinds with orange or yellow, or both in combination, seem to be most valued, but the single ones are the more graceful. They are very serviceable flowers in every way, and among the easiest plants to grow from seed. Self-sown seedlings are very apt to appear in gardens where the flowers have been allowed to mature. Seed may be sown with the main crop of annuals, as before advised, and require no special attention.

Carnations were placed on the list of annuals only a few years ago, and they have proved quite the most important and valuable of recent additions to the garden, for, owing to the growing of perennial Carnations for cultivation under glass and for winter-flowering, we were without a race of satisfactory summer-flowering Carnations, though specially treated plants were used for that purpose. The Marguerite Carnations possess most of the good qualities of the florists' Carnations and flower from seed in about four months. They have single-colored flowers of the Carnation shades, and all, except a small percentage, may be expected to prove fully double. They are free-flowering, of the remontant type, that is, they flower in a succession of crops rather than continuously. They are probably perennial in duration, though they are usually only grown for summer flowers. The seed may be sown indoors, or with the main supply of annuals, care only being required that they may not be overwatered. The plants are readily shifted and grow rapidly in good rich loam. Like all Carnations, water should be applied to the roots rather than to the foliage.

Clianthus Dampieri, the Glory Pea, is an annual which bears very unique and handsome flowers when it can be induced to grow, but it has not been a plant which could be recommended for general cultivation. I mention it, however, from the fact that a new strain has been lately offered (by Dreer), in which the plants are said to be more hardy, as the result of careful selection in a cold climate. My experiment with this strain last year leads me to believe this claim well grounded, for, though the seedlings were started late and did not flower, I have never before had such promising, vigorous plants of this species. The seed should be sown early; March would probably be the right time. They germinate best in wet woolen cloths, and should be planted after the germ shows. Any one who has struggled with this plant grown from the Australian seed, as usually supplied, knows that it has been one of the most uncertain ones in the florist's list.

Cosmos has lately become a most popular annual, and of recent years it has also become a favorite flower with the florist. It certainly is a most beautiful plant, with the very finely cut foliage, over which airily poise the handsome single flowers. The white variety is the most effective, the so-called pink being inclined to a dull purple. Henderson offers a strain, the flowers of which are twice the size of the ordinary variety, but the greatest improvement in the Cosmos would be a reduction in the height of the plants, which often reach six or seven feet. Plants of, say, three feet, of the same character would be grand additions to our autumn gardens and conservatories, and could be easily protected from the frosts which are usually due with their flowers. Cosmos seems to be a plant of a special season—October—and it apparently is of little importance to sow the seed earlier than with the main crop of annuals.

Elizabeth, N. J. *J. N. Gerard.*

Border Flowers in February.

SUNDAY, February 11th, was a day of bright sunshine, with a genial temperature, and the little colony of winter flowers under my windows spread their petals and fairly smiled with their reawakening. Stray flowers have been gradually unfolding for several weeks as the rigor of the days relented, but it was not until then that the more close plantings were effective. Rarely beautiful in this winter weather were the bright rosy flowers of Crocus Imperati, with the strong purple and clear blue of Iris Persica and I. Histrio, all fully expanded, and with every color made more vivid by the pure white of the Snowdrops (Elwes and its varieties), which were blooming all about them. Iris Histrio is the earliest of the Reticulata Irises, and has a fair claim to the distinction of being the handsomest of the section. It is nearly blue, and the falls are lined and spotted with exquisite markings. This Iris is also rather more delicate, apparently, than the other members of the same group, and it is doubtful if it will survive many seasons, unless in a very warm border. The foliage appears before the flowers, and I notice that it is more affected by hard weather than the others, which may militate against the ripening of the bulbs. Iris Persica, var. purpurea, which is one of Max Leichtlin's introductions, opened a few days before I. Histrio. This variety is a decidedly pretty little flower, blossoming low like the type, but very dark reddish-purple in color, with an orange ridge, and white marking on the fall. Both of these Irises were ready to expand a week earlier, but the temperature at the time dropped to four degrees, Fahrenheit, and their appearance was delayed. I have observed that when the flowers named are sheltered from the winds they will endure the lowest temperature we have here and remain uninjured. Over the Irises I fasten frames of glass held in wire frames, but open at the sides, to protect them from snow and storms. The garden is now hidden under the snow, but these flowers will again appear, when more genial conditions favor us, as bright as ever and quite uninjured by their temporary eclipse.

Elizabeth, N. J. *J. N. G.*

Correspondence.

The Beauty of Orchids.

To the Editor of GARDEN AND FOREST:

Sir,—In an interesting article on "Orchids," published in the February number of *Scribner's Magazine*, Mr. W. A. Stiles says: "They have such a high-bred air that no one thinks of questioning their rank as the true aristocracy among flowers. They are so distinct from the mass of garden-flowers that they seem to belong to a nobler race. They possess refinement of form, grace of bearing, delicacy of texture, purity of color, and many of them delicious fragrance—every attribute, indeed, which in a flower compels admiration." Similarly an English amateur wrote not long ago: "Fancy has not conceived such loveliness, complete all round, as theirs—form, color, grace, distribution, detail and broad effect."

These words certainly echo the feeling of countless horticulturists and flower-lovers, and I am ready to believe with Mr. Stiles that "the cultivation of Orchids would flourish without the adventitious attraction" which is given by their exotic origin and, often, by their consequent rarity and costliness. Nevertheless, this adventitious attraction has, of course, increased their vogue. All Orchids do not deserve the praise which Mr. Stiles gives them as a whole, and some of those which have the least intrinsic charm are among the most popular. The Lycastes, for instance, have thick, fleshy, clumsy petals, which certainly cannot be called delicate; and sometimes they are muddy and impure in tint.

But I want especially to note that while very many persons would heartily endorse Mr. Stiles' general estimate of the attractiveness of the Orchid race, there are others who boldly question its right to be called nobler, more aristocratic, or in any way more delightful, than other floral races. Showy, peculiar, and therefore, as I may say, very aggressive in their claims upon the eye, Orchids seem to have an especial faculty of exciting not only particularly strong likings, but, on the other hand, particularly strong dislikings. If one chances to care about them, nothing else is admitted into comparison with them; but if not, it seems possible actually to hate them. I have a friend who always humorously insists that their name must be a corruption of "Awkwards"; and another, an artist, who confesses, "I used not to like them, but my taste has gradually become perverted"; and a third, who declares, on the contrary, that at first they interested her, but now "they have become intolerable."

In some cases the feeling against them is doubtless due to the mere fact of their extreme popularity; some people are naturally prompted to dislike anything which is generally praised, especially if its popularity leads at times to the undervaluation of other commendable things. Again, there are persons who are instinctively repelled by eccentricity, peculiarity, or even novelty; persons of conservative taste, who delight in the familiar, the normal, even the commonplace, and cling to old things because they have always loved them, and turn away from new things, because to admire them would mean a fresh attitude of mind.

But a third and better reason may be found for the distaste sometimes shown toward Orchids. What many people call their love for plants is simply a love for flowers. But there are others with whom it means a love for the whole organism as seen individually, and, still more, as seen in the varied yet harmonious environment of natural conditions. These people take more delight in the aspect of a flowery meadow than in gathering bunches of Daisies, Buttercups and Clover; they would rather stoop for a moment over a rare wild flower, growing at the foot of a forest-tree, than pick it to carry home, preferring to remember the picture it made swinging amid Ferns and Mosses, and flickering lights and shadows, rather than to see the picture it makes when put in a vase on the mantel-piece. And it is among such people, I think, that one often hears expressed a dislike toward Orchids, or, at least, an indifference to their charms. Of course, we are now speaking of the Orchids grown in our hot-houses, which are of foreign origin and usually of epiphytal character. The people I have in mind do not deny the beauty of their flowers, or claim that it is less than the beauty of those borne by our native Orchids, which they admire so truly—the fragile sweet-scented pale-pink Pogonia, growing by the roadside in a sunny ditch; the white-fringed Habenaria, springing in snowy clumps from a tangled corner of a swamp, or its lilac-fringed cousin overtopping the grasses of a river-side field; the Calopogon flushing patches of pasture to a soft purplish tone, the rosy Cypripedium nodding in some dusky recess at the base of a Pine near the edge of a woodland road, or the splendid parti-colored Calypso gleaming from a boggy corner of the forest's very heart. Nothing, they confess, could be more gorgeous than the flowers of some exotic Orchids, more dazzlingly beautiful than others, more curiously interesting, or more delicately dainty and fairy-like, than others again. But, nevertheless, the aspect of a basket of these Orchids, or of a hot-house shelf filled with them, gives them little pleasure. The flowers are beautiful, they say, but the plants are not.

Rarely, in truth, is an Orchid-plant, grown in our hot-houses, a beautiful object as a whole. Sometimes the foliage is attractive, but often it is not; and when it is, its effect may be injured by the aspect of the naked, oddly-shaped pseudo-bulbs which bear it. Frequently the rich masses or streamers of blossoms develop from long bare gray stalks; and sometimes such stalks are queerly attached to the body of the plant. Among the Vandas, for instance, we find a tall column of stiffly opposed leaves, bearing, in the most accidental-seeming manner, a long, twisted, dead-looking flower-stalk, the great panicle of whose flowers seems over-heavy for the plant, as well as devoid of any organic relationship with it. "The flowers are beautiful, yes," said one of the friends of whom I have already spoken, with regard to a Vanda; "but how can I admire them on such a stalk, especially as it looks as though it has been fastened to the plant with a pin?" To people who feel in this way, cut Orchids, gracefully arranged in a vase, are more satisfactory than growing Orchids, however much they

may prefer to see blossoms of other kinds in their natural environment.

I need hardly explain, however, that they feel thus toward Orchids because they are not grown in their natural environment. Monsieur De Longpré's pictures, in the article in *Scribner's Magazine*, to which I referred at the outset, may, perhaps, give some people, unacquainted with Orchid-houses, ideas of beauty which will not be entirely fulfilled by a sight of his originals; for, while these were hot-house specimens, the grace of his imagination and his pencil has supplied them an atmosphere which suggests their appearance in their natural habitats. Could we see our Orchid-plants in this habitat, the most accustomed eye would confess that it had never really seen them before. There, their ugly features are masked from view by luxuriant surrounding growths, or are so far removed from the eye as to be inconspicuous, or, if seen, they fit so well with the general character of the local vegetation that they no longer seem ugly. Only the blossoms themselves attract attention, mysteriously emerging from splendid tangles of tropical foliage, or appearing to spring, not from thickened bases of their own so much as from excrescences of the tree that supports them, or seeming to float in the air like swarms of gorgeous butterflies—their own splendor clearly perceived, the grayish leafless flower-stalks invisible at that distance. Seen thus, they must delight, not only the person who loves flowers, but, in equal degree, the person who loves plants, and him who especially loves those beautiful general effects which untutored, undisturbed Nature produces with her plants and flowers.

But there is still another class of persons in whom Orchids arouse no great enthusiasm. And these object, not to the unfortunate effect of plants dissevered from the surroundings which Nature gave them, but to the character of their flowers as such. They will tell you that all Orchids are interesting because of their individuality, but that even some of the showiest are not beautiful, and that the most beautiful are those which are least eccentric, least irregular. And this illustrates a fundamental diversity among human beings as regards their æsthetic leanings.

It has been said that, as some men are born Platonists and some Aristotelians, so some are born classicists in art and some Gothicists; and this means that some of us are specially appealed to by symmetry, harmony, balance and repose, and others by variety, irregularity, vivacity and piquancy. The quarrel over the beauty of Orchid-flowers is, in truth, but the old quarrel between the classicist and the romanticist showing itself in a novel way, or the modern quarrel over the pre-eminence of Japanese art-ideals showing itself in the realm of Nature. To all of us Japanese art is interesting, charming, significant and delightful in its own way; but while to some it has a charm equaled by no other artistic developments, to others it speaks with an alien tongue, and seems immeasurably inferior to the art of the occidental world when studied in its best developments. The difference has, however, really nothing to do with quality—it is a difference as regards fundamental ideals. The ideal of Japanese art is a perpetual asymmetry, a perpetual variety, a perpetual changefulness and pliancy, and, I may say, liquidity. It is, above all, an art of motion, and, therefore, of suggestion. And as such it is so diametrically opposed to Greek art that one can hardly understand how the same mind can feel entire satisfaction even in the best products of both developments. Of course, no real comparison between works and works is possible; but this is the very point: when underlying motives and ideals are so alien that their products cannot be compared, it seems as though all men must, by birth, be ranged upon the one side or the other, having admiration to give to the opposite side, but not that innate full appreciation, that feeling of entire contentment as in personal ideals fully realized by other minds, which they give to their own side. Your true-born classicist is never stirred even by the most wonderful products of Japanese art as he is stirred by fragments of the art of Greece, based upon ideals of symmetry, order, repetition, reposefulness and definite realization.

Now, it may seem fantastic to transfer these facts into the domain presided over by the naive Goddess Flora. But a man's æsthetic bent, if he really has any, and not merely a mass of acquired or imitative tastes, shows itself with regard to everything he sees, from statues to bonnets, from pediments to flowers. If he is a born romanticist, he will probably have a genuine passion for Orchids; if he is a born classicist, he will admire them in a measure, of course, but he will not have a genuine passion for them; he will not call them the aristocrats and queens among flowers; and, if he is very intense in his classicism, he may easily find their beauty of an unsatisfying, disturbing, discomforting sort. The Narcissus, he will tell you, is his ideal of perfect beauty. Or, if it seems too coldly pure, too sculpturesquely formal, he will point you to the Lily or the Water-lily, or, with especial emphasis, to the Iris. Here is variety enough in both form and color, surely, but existing with perfect symmetry, balance and repose of effect, and, therefore, with more dignity, more true aristocracy of air, than one can find in any Orchid. And, again, in a different direction, he will point out the Pansy. The general type of form in the Pansy is that of many Orchids; but it surpasses them just in so far as this type is expressed with less boldness of accentuation, in a more reserved and balanced—and therefore more classic—way.

So there is nothing absolute in the matter. You cannot say, this is best, this is most beautiful; you can only say, I like this best, I find this most beautiful. And, according to your preference in this matter of flowers, you may decide whether you are a born classicist or a born romanticist. For myself, I may confess that I admire Orchids immensely, but that there is more true beauty, to my eyes, in an Iris-flower, even in one of those little ones which blue our native meadows in June, than in any Orchid I have ever seen. And if earthly flowers live again in heaven, I can think of its glades as sprinkled with Narcissi and Lilies and Pansies much more easily than as canopied with streamers of Orchids. You may feel differently, for you were born with one sort of æsthetic taste, and I with another. It is a matter of fate, not of caprice, whether one loves Orchids or does not.

New York, N. Y. *M. G. Van Rensselaer.*

[When the Chrysanthemum is called the Queen of Autumn, or the Birch is spoken of as the Lady of the Woods, no one interprets this language as any reflection upon other flowers or trees. When Orchids are styled aristocratic, high-bred or noble, such expressions call attention to a certain air of distinction which these plants wear, and do not imply that they are superior, in all respects, to other plants. One may admire a high-bred lady without being insensible to the charms of a rustic beauty. Facts do not bear out the statement that "when one cares about Orchids nothing else is admitted into comparison with them." Many persons have a genuine admiration for Orchids, and have at the same time a thorough appreciation of the loveliness of way-side wild flowers. It may be true that there are persons "who actually hate Orchids," or think they do, because they see them amid unnatural surroundings; but, to be strictly logical, such persons ought not to admire any plants grown under glass or other artificial conditions.

The theory that one whose inborn taste inclines him to the forms of classic art will admire Daffodils and Pansies, and will find no satisfaction in Orchids, seems too finely drawn and fanciful to have any substantial value.—ED.]

Recent Publications.

Greenhouse Construction. By L. R. Taft. New York: Orange Judd Co.

Four or five years ago Professor Taft built two forcing-houses for the Michigan Experiment Station, principally to test the relative merits of steam and hot-water for heating purposes, but also to compare the different methods of construction, of glazing and of ventilation. The bulletin which reported the results of the heating tests was widely copied, and brought so many letters of inquiry from all parts of the country asking for advice on various points in the design and construction of greenhouses, that no further proof was needed of the wide-spread desire for information on these subjects. It is to supply such information that this little book was written. Professor Taft's personal experience, in addition to his careful study of the subject in the leading private and commercial establishments where glass-houses are used throughout the country, has enabled him to prepare a manual which is admirable in its compactness and completeness. In its twenty chapters, two hundred pages and one hundred and eighteen illustrations, every amateur or commercial plant-grower who uses a greenhouse or hot-bed, cold-frame or plant-pit can find something that will broaden his knowledge or freshen up

what he already knows, or stimulate him to some sharp thinking about the materials for building, the arrangement of his houses, with their shading, heating, ventilation and general furnishing.

Notes.

Leaves of the Talipot Palm in Ceylon sometimes attain the length of twenty feet, with a width of eighteen feet. They are used by the natives in making tents. The leaves of the double Cocoanut Palm are often thirty feet long, while those of the Inaja Palm on the banks of the rivers of Brazil are sometimes fifty feet long and ten to twelve feet wide.

A correspondent of the *Country Gentleman* makes note of the fact that he found the Skunk Cabbage in bloom on the 26th of January at Redding, Connecticut. This is always one of our early flowers, but we have never seen one in this latitude open in January. It is really a handsome flower and it never emits the odor which justifies its common name unless it is bruised.

The Spinach mildew, which has of late been a serious trouble in the truck-fields in this vicinity, can only be controlled by the use of some compound of copper which will prevent the germination of the specific fungus spores on the plants. The Bordeaux mixture could be used once or twice a week, but, inasmuch as it is necessary to spray the under surface of the leaves of the plants, the nozzle of the sprayer should be held close to the ground so as to reach every exposed portion of the plant.

The eighth volume of De Candolle's *Suites au Prodromus Systematis Naturalis Regni Vegetabilis*, which has just reached us, is devoted to the Guttiferæ, and is from the pen of Julien Vesque. The editor, Cassimere De Candolle, of the third generation of the family of illustrious Geneva botanists, calls attention to the fact that the publication of this volume marks a solemn date in the progress of the enterprise, as it is the last upon which his father, the second of the name, was occupied. As the surviving editor of the work, Monsieur Candolle expresses the hope of being able to complete it on the plan under which it was commenced.

The most important work on systematic botany which has recently appeared, Engler & Prantl's account of the natural families, is now nearing completion, the ninety-third part having recently reached us. This work, which seems destined to have an important influence on American botany, as it has been adopted as a model in the arrangement of the natural groups of families and genera for the *New Flora of North America*, which a number of American botanists have arranged to prepare, is published at Leipsic, by Wilhelm Engelmann. The price of subscription is one mark and a half for each part. At the present rate at which the work is appearing there is every evidence that it will be completed during the current year.

Many of our native shrubs can be successfully forced in winter. Of these Mr. Jackson Dawson considers the best: Andromeda speciosa, A. floribunda, Rhododendron nudiflorum, the Rhodora, Epigæa repens, Pyrus nigra, Kalmia latifolia, Ledum latifolium, Prunus pumila and Vaccinium stamineum. Some of these, like the Andromedas, Pyrus nigra, Kalmia and Vaccinium, would carry well and could be used in the trade to as good advantage as the Deutzias, Lilacs, Citisus and other foreign plants which are now largely raised. These shrubs, grown in a cool-house, would make handsome decorative plants for winter and early spring work, and they would flower more abundantly and often make more perfect specimens than they do when left to themselves out-of-doors.

Last year we gave some account of the efforts to check the spread of the tent-caterpillar in certain parts of Massachusetts by offering prizes to the children for collecting the largest number of belts, as well as a certain sum for each thousand. We have received a circular which is signed by D. D. Slade, President, and L. H. Farlow, Secretary of the Newton Horticultural Society, which has been doing work of this kind. In the winter of 1891–92 it is estimated that 25,000 eggs of caterpillars were destroyed, and during the winter of 1892–93 more than 40,000 were destroyed. The city of Newton also appropriated $500 to be used under proper supervision for cutting down such trees as formed breeding-places for insect pests. The Newton Horticultural Society proposes to continue this work this year, and offers to pay a bounty of $1.00 for every thousand belts, while the city has appropriated $800 for the continuation of its work. The enlistment of children in this crusade against destructive insects is valuable, not only for its immediate effect in checking the ravages of these pests, but it has a certain educational value by encouraging in children habits of observation and furnishing object-lessons in more than one natural science.

Mr. Albert M. Herr writes to the *American Florist* that some growers of Carnation-flowers for market are raising their plants from seed. Mr. Shelmire, who is an expert in the cultivation of these plants, finds that nearly all seedlings of the variety Cæsar have good double salable flowers. Of course, a few of them will produce flowers that are inferior, but seedlings have so much more vigor than cuttings, and are free from rust and other diseases which come from propagating from infested plants, that they prove as profitable, at least, as plants from cuttings of the standard varieties. Other growers are experimenting with the variety Buttercup, and it is said that a large percentage of the seedlings come true. Mr. Herr suggests that when a variety shows this persistence of type, it might be possible, at least after a few years' selection, during which all strange pollen is excluded and the flowers on each plant fertilized with the flowers of another of the same variety, so as to prevent self-fecundation, which is supposed to cause weakness of constitution, a strain of seed might be secured which could be trusted to reproduce the parent variety with certainty. Experiments of this sort are worthy of trial, no doubt, since plants from seed have many advantages over those from cuttings.

Professor Troup, in a recent report on some experiments with small fruits, speaks of the necessity of adopting some means to secure an adequate water-supply. Strawberries and other small fruits which ripen early in the summer were almost completely ruined last year by the severe drought, and since these fruits always require a large amount of water during the ripening period to enable them to develop properly, experience has shown that it is not safe to depend on the natural rainfall, not so much because this is insufficient in amount, as because it is not properly distributed. The average monthly rainfall in Indiana during the six growing months would usually be sufficient if it were properly distributed, but while there were 4.13 inches of rainfall at the station during May and June, there was little more than one inch in June, and all this fell in four days, leaving twenty-six days without any rainfall. An inch of water during the dry periods would have been worth thousands of dollars in every location where fruit is grown. Near Muncie, Indiana, Mr. Lewis Cowing, when he found his crop threatened by drought, bought an engine which could be propelled by natural gas, and placed it in a well so that he could raise the water over a large portion of his berry-garden. His well seemed almost inexhaustible and he had a good crop of perfect berries. The gas-engine and pipe cost him $90, but he saved a crop worth more than $300. On a few rows not watered the fruit was worthless. After the Blackberry season was over he turned the water on his Celery with most profitable results.

The *Orchid Review* for February contains the first of a series of articles on the "History of the Cultivation of Orchids," and they promise to be as interesting as the series on the "Hybridization of Orchids," which ran through the numbers of the same monthly last year. This opening chapter shows that Orchid-culture, as we know it, did not exist until the beginning of this century, although some very interesting details are given of the introduction of tropical Orchids in the first half of the eighteenth century. Bletia verecunda was the first tropical Orchid ever cultivated in England. The plant was sent as a dried specimen to Peter Collinson in 1731 from the Bahamas, and Collinson, not despairing of life in the tubers, sent them to the garden of a Mr. Wager, where they were placed in a tan-bark bed during the winter, and, having recovered health, produced flowers the next summer. Two of our North American Cypripediums, C. spectabile and another one, which may have been C. pubescens, were cultivated, perhaps, as early as 1737. At the end of the century there were cultivated in English gardens, besides several hardy species, Orchids which had been brought home by travelers, naval officers and military officers from the West Indies, China and the Cape of Good Hope, although when these managed to survive the long trip in sailing vessels, they were in too many cases killed on their arrival by improper treatment. Our beautiful little Calopogon pulchellus was introduced accidentally in some bog-earth which had been taken over to England with some plants of Dionæa for the botanist Curtis. His gardener noticed some small tooth-like, knobby roots in the soil, and having placed them in pots of the same earth and plunged them in a tan-pit with gentle heat they produced plants the following summer which flowered, and from the strongest of these plants the first Orchid was figured in 1790 in the *Botanical Magazine*, vol. iii., t. 116.